

PROJECT TITLE : PROTAGORAS  
PERIOD COVERED : MAY 1 - 31, 1980  
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The aim of the project is the determination of the influences proteins of tobacco have on the smoke composition, on smoke condensate and on cigarette subjectives. Our present problems are the extraction of proteins from tobacco and the preparation of re-constituted tobacco sheets.

PROTEIN EXTRACTION FORM TOBACCO DUST (1)

The extraction of proteins from tobacco with only mechanical means (homogenization) showed to be impossible (2). In order to bring tobacco proteins into solution, extractions were carried out in presence of proteolytic enzymes. Thus, 100 g of tobacco dust (containing 13.1 % protein) were combined with 500 ml water and the pH was adjusted to 7.0 (2.0 in case of pepsin). After the addition of 200 mg of a proteolytic enzyme, the mixture was shaken during six hours at 37° C. After centrifugation the following percentages of tobacco proteins were found in the extract:

Proteolytic enzyme	% proteins extracted	final pH
Trypsin	28.4	7.2
Pepsin	40.8	2.0
Alcalase (Novo)	31.6	6.9
Protease (Calbiochem)	45.7	7.1

An increase of the extraction time from 6 to 24 hours did not increase the percentage of proteins extracted.

A subsequent treatment of tobacco dust with pepsin, followed by trypsin increased the protein extraction to 44 %.

### PROTEIN EXTRACTION FROM BURLEY STRIPS (3)

Similar extractions using whole Burley strips and the protolytic enzyme trypsin did not give any positive results yet.

### SHEET EVALUATION (4)

Tests were carried out to reconstitute the partially deproteinated tobacco dust. A method using carboxymethylcellulose (CMC) has proven to be feasible (5).

### FUTURE WORK

The enzyme treatment of tobacco dust and other tobacco material will be optimized. Trials to eliminate proteins from the extracts will start.

CMC-sheets will be prepared using untreated and deproteinated tobacco material.

### REFERENCES

- (1) A. Hänggi, Notebook 791203, 1-5
- (2) D. Schulthess, Monthly Report Protagoras, April 1980
- (3) M.F. Mangilli, Notebook 791205, 36/37
- (4) A. Hänggi, Notebook 791203, 6-8
- (5) Jansson, R. and Lilja, L., Auslegeschrift 1517240, Federal Republic of Germany, 1970

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